Louisiana Department of Environmental Quality
Office of Environmental Services

STATEMENT OF BASIS
For
Activity Number: PER20050032
Permit No. 2669-V2

Geismar Plant - Olefins Units
Agency Interest No. 1136
Shell Chemical LP
Geismar, Ascension Parish, Louisiana

I. APPLICANT

Company
Shell Chemical LP
Post Office Box 500
Geismar, Louisiana 70734

Facility
Geismar Plant - Olefins Units
7594 Highway 75, Geismar, Ascension Parish, Louisiana
UTM Coordinates: 693.20 kilometers East and 3340.74 kilometers North, Zone 15

II. FACILITY AND CURRENT PERMIT STATUS

The Olefins Units consists of three Shell Higher Olefins Process (SHOP) Units (SHOP 1, SHOP 2, and SHOP 3). The SHOP units produce a range (C4 – C20+) of alpha and internal olefins. The alpha olefins (AO) section converts ethylene into linear, even carbon numbered alpha olefins. Select range of alpha olefins are separate by distillation and then sold as final products, used as feedstock for other plant processing units, or converted to internal even and odd number olefins at the isomerization disproportionation (ID) section. The internal olefins are separate by distillation and then sold as final products or used as feedstock for other plant processing units.

The Olefins Units are parts of the Shell's Geismar Plant. Active permits and pending applications for the operations at the facilities are listed as follows:

Permit Number	Units or Sources	Date Issued
2489-V0	PDO-1 Unit	November 3, 1997
PSD-LA-611	Polymers Complex	October 27, 1997
PSD-LA-647(M2)	Olefin Units	February 26, 2002
2800-V0	Storage Tank	April 17, 2002
2669-V1	Olefin Units	June 26, 2001
2151-V2	Alcohol and OFP Units	March 21, 2003
2729-V0	Cogeneration Unit	December 22, 2003

Geismar Plant - Olefins Units
Agency Interest No. 1136
Shell Chemical LP
Geismar, Ascension Parish, Louisiana
Activity Number: PER20050032
Permit No. 2669-V2

Permit Number	Units or Sources	Date Issued
2727-V1	Logistics	January 26, 2007
3030-V0	EOEG-1 Unit	May 21, 2006
2057-V4	EOEG-2 Unit	March 21, 2007
2185-V2	EOEG-3 Unit	June 28, 2006
3001-V1	M Unit	May 2, 2006
2136-V2	Utilities	June 30, 2002
2489-V1	PDO-1 Unit	Application Pending
2669-V2	Olefin Units	Application Pending
2729-V2	Cogeneration Unit	Application Pending
2136-V3	Utilities	Application Pending
3001-V3	M Unit	Application Pending
2151-V3	Alcohol and OFP Units	Application Pending

III. PROPOSED PERMIT / PROJECT INFORMATION

Proposed Permit

A permit application and Emission Inventory Questionnaire dated December 16, 2005 as well as additional information dated December 18, 2006 and May 10, 2007, were submitted requesting a Part 70 operating permit renewal.

A notice requesting public comment on the permit was published in *The Advocate*, Baton Rouge, and in the local newspaper. A copy of the public notice was mailed to concerned citizens listed in the Office of Environmental Services Public Notice Mailing List. The application and proposed permit were submitted to the Ascension Parish Library. The proposed permit was submitted to US EPA Region 6. All comments will be considered prior to the final permit decision.

Project description

Shell Chemical LP requested a Part 70 operating permit renewal for the Olefins Units to include several previously authorized projects, an existing chilled water tank, and a sewer sump. Emissions from the facility were recalculated based on updated emissions factors and actual operating conditions of the units.

Geismar Plant - Olefins Units
Agency Interest No. 1136
Shell Chemical LP
Geismar, Ascension Parish, Louisiana
Activity Number: PER20050032
Permit No. 2669-V2

Permitted Air Emissions

Permitted emissions from Olefins Units in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	53.82	52.01	- 1.81
SO_2	2.21	0.89	- 1.32
NO_X	369.86	560.58	+ 190.72
CO	272.59	271.12	- 1.47
VOC	403.24	398.77	- 4.47

Prevention of Significant Deterioration (PSD) Applicability

PM_{10}, NO_X, and CO emissions from several emission points increase more than the limits of Permit PSD-LA-647(M2). These emissions were review under the PSD regulations and documented in Permit PSD-LA-647(M3).

Maximum Achievable Control Technology (MACT) requirements

Internal floating roofs are determined as MACT for TAP emissions from VOC tanks. MACT for the flare system is complying with 40 CFR 63.11(b).

Air Modeling Analysis

Emissions from the incinerator are not expected to cause or to contribute to any National Ambient Air Quality Standards (NAAQS) or Ambient Air Standards (AAS) exceedances.

Dispersion Model Used: (None)

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the proposed Part 70 permit. The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the proposed permit.

Geismar Plant - Olefins Units
Agency Interest No. 1136
Shell Chemical LP
Geismar, Ascension Parish, Louisiana
Activity Number: PER20050032
Permit No. 2669-V2

IV. PERMIT SHIELDS

The Permit does not include any Permit Shields

V. PERIODIC MONITORING

The Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the proposed permit.

VI. APLICABILITY AND EXEMPTIONS OF SELECTED SUBJECT ITEMS

ID No:	Requirement	Status	Citation	Explanation
EQT355, EQT399, EQT464, EQT465, EQT466, EQT481	LAC 33:III.1503. Emission Standards for Sulfur Dioxide	Exempt	LAC 33:III.1503.C	SO_2 emissions < 250 tons/year
	LAC 33:III.1511 CEM for SO_2	Exempt	LAC 33:III.1511.A	SO_2 emissions < 100 tons/year
	NESHAP Subpart DDDDD	Exempt	40 CFR 63.7506(b)	Existing large gaseous fuel. Subject to initial notification only
EQT356	LAC 33:III.2103 for VOC storage	Does not apply	LAC 33:III.2103.A	Vapor Pressure < 1.5 psia
	NSPS Subpart Kb for tanks	Does not apply	40 CFR 63.110b(a)	Volume < 20,000 gallons
EQT357	LAC 33:III.1503. Emission Standards for Sulfur Dioxide	Exempt	LAC 33:III.1503.C	SO_2 emissions < 250 tons/year
	LAC 33:III.1511 CEM for SO_2	Exempt	LAC 33:III.1511.A	SO_2 emissions < 100 tons/year
	NESHAP Subpart DDDDD	Exempt	40 CFR 63.7506(b)	Existing large gaseous fuel. Subject to initial notification only
	LAC 33:III.2147	Exempt	LAC 33:III.2147.A.2.a	Existing combustion device
EQT358, EQT359, EQT363, EQT365, EQT368, EQT370	LAC 33:III.2103 for VOC storage	Does not apply	LAC 33:III.2103.A	Vapor Pressure < 1.5 psia
EQT372, EQT376 EQT378 - EQT386	NSPS Subpart Kb for tanks	Does not apply	40 CFR 63.110b(a)	Vapor pressure < 0.51 psia
EQT360, EQT411, EQT412	LAC 33:III.1503. Emission Standards for Sulfur Dioxide	Exempt	LAC 33:III.1503.C	SO_2 emissions < 250 tons/year
	LAC 33:III.1511 CEM for SO_2	Exempt	LAC 33:III.1511.A	SO_2 emissions < 100 tons/year

Geismar Plant - Olefins Units
Agency Interest No. 1136
Shell Chemical LP
Geismar, Ascension Parish, Louisiana
Activity Number: PER20050032
Permit No. 2669-V2

ID No:	Requirement	Status	Citation	Explanation
EQT361	LAC 33:III.2109	Exempt	LAC 33:III.2109.B.3	Vapor Pressure < 0.5 psia
EQT364, EQT366	NSPS Subpart NNN	Does not apply	40 CFR 60.660	No modification after December 30, 1983
	NSPS Subpart RRR	Does not apply	40 CFR 60.700	No modification after June 29, 1990
	LAC 33:III.2115	Does not apply	LAC 33:III.2115	Subject to LAC 33:III.2147
EQT367	NSPS Subpart NNN	Does not apply	40 CFR 60.660	No modification after December 30, 1983
	NSPS Subpart RRR	Does not apply	40 CFR 60.700	No modification after June 29, 1990
	LAC 33:III.2115	Exempt	LAC 33:III.2115.H.1.c	VOC emissions <100 lbs/24 hours
	LAC 33:III.2147	Does not apply	LAC 33:III.2147	Vents from relief valves, equipment leaks, storage vessels, transfer, or wastewater
EQT369, EQT371, EQT373- EQT375, EQT387, EQT389, EQT390, EQT393, EQT395, EQT396	NSPS Subpart Kb for tanks	Does not apply	40 CFR 63.110b(a)	The tanks were constructed prior to July 23, 1984
EQT377, EQT468, EQT469	NSPS Subpart NNN	Does not apply	40 CFR 60.660	Not from an affected facility
	NSPS Subpart RRR	Does not apply	40 CFR 60.700	Does not originate from a reactor process
	LAC 33:III.2115	Does not apply	LAC 33:III.2115.H.1.d	Does not contain VOC
	LAC 33:III.2147	Does not apply	LAC 33:III.2147.A.2.f	Does not use, contain, or produce VOC
EQT388, EQT391, EQT392, EQT394, EQT397, EQT400	LAC 33:III.2103 for VOC storage	Does not apply	LAC 33:III.2103.A	Vapor Pressure < 1.5 psia
EQT402, EQT403, EQT404, EQT424 –EQT427	NSPS Subpart Kb for tanks	Does not apply	40 CFR 63.110b(a)	Vapor pressure < 0.51 psia
EQT398	NSPS Subpart NNN	Does not apply	40 CFR 60.660	Not from an affected facility
	NSPS Subpart RRR	Does not apply	40 CFR 60.700	Does not originate from a reactor process
	LAC 33:III.2115	Does not apply	LAC 33:III.2115	Subject to LAC 33:III.2147

Geismar Plant - Olefins Units
Agency Interest No. 1136
Shell Chemical LP
Geismar, Ascension Parish, Louisiana
Activity Number: PER20050032
Permit No. 2669-V2

ID No:	Requirement	Status	Citation	Explanation
EQT401, EQT476, EQT487	LAC 33:III.2103 for VOC storage	Does not apply	LAC 33:III.2103.A	Vapor Pressure < 1.5 psia
	NSPS Subpart Kb for tanks	Does not apply	40 CFR 63.110b(a)	Vapor pressure < 0.51 psia
	LAC 33:III.5109 MACT Requirements	Does not apply	LAC 33:III.5109.A	MACT is not required for Class III TAPs
EQT406	LAC 33:III.2109	Does not apply	LAC 33:III.2109.B.3	Vapor Pressure < 0.5 psia
EQT407, EQT549	NSPS Subpart NNN	Exempt	40 CFR 60.660(c)(6)	Vent flow rate < 0.008 scm/m
	LAC 33:III.2115	Does not apply	LAC 33:III.2115	Subject to NSPS Subpart NNN
	LAC 33:III.2147	Does not apply	LAC 33:III.2147.A.2.f	Subject to NSPS Subpart NNN
EQT408	NSPS Subpart NNN	Does not apply	40 CFR 60.660	No modification after December 30, 1983
	NSPS Subpart RRR	Does not apply	40 CFR 60.700	No modification after June 29, 1990
	LAC 33:III.2115	Does not apply	LAC 33:III.2115	Subject to LAC 33:III.2147
	LAC 33:III.2147	Exempt	LAC 33:III.2147.A.2.a	Vent to an existing furnace, EQT357
EQT410	LAC 33:III.2109	Does not apply	LAC 33:III.2109.B.3	Vapor Pressure < 0.5 psia
EQT423, EQT470	LAC 33:III.1503. Emission Standards for Sulfur Dioxide	Exempt	LAC 33:III.1503.C	SO_2 emissions < 250 tons/year
	LAC 33:III.1511 CEM for SO_2	Exempt	LAC 33:III.1511.A	SO_2 emissions < 100 tons/year
	NESHAP Subpart ZZZZ	Does not apply	40 CFR 63.6590	Engine rating < 500 horsepower
EQT439 – QT443 EQT445, EQT451, EQT453, EQT471	LAC 33:III.2103 for VOC storage	Does not apply	LAC 33:III.2103.A	Vapor Pressure < 1.5 psia
EQT455 –EQT462 EQT485, EQT486 EQT488 - EQT496 EQT499	NSPS Subpart Kb for tanks	Does not apply	40 CFR 63.110b(a)	Vapor pressure < 0.51 psia
EQT444	LAC 33:III.2103 for VOC storage	Does not apply	LAC 33:III.2103.A	Vapor Pressure < 1.5 psia
EQT449, EQT484	40 CFR 63 Subpart Q	Does not apply	40 CFR 63.400	No chromium based water treatment chemicals are used

ID No:	Requirement	Status	Citation	Explanation
EQT472, EQT473, EQT474, EQT482, EQT483	LAC 33:III.2109	Does not apply	LAC 33:III.2109	Do not meet the definition of an oil/water separator
EQT478	NSPS Subpart Kb	Does not apply	40 CFR 60.110b(d)(2)	Pressure vessel
EQT546	NSPS Subpart RRR	Exempt	40 CFR 60.700(c)(5)	Vented to a distillation column which is subject to NSPS Subpart NNN
EQT547, EQT548	NSPS Subpart NNN	Exempt	40 CFR 60.660(c)(4)	TRE index value > 8.0 (exempt from the subpart, except 40 CFR 60.662, 664(d), (e), (f), 665(h), and l)
EQT550, EQT551, EQT552	NSPS Subpart NNN	Does not apply	40 CFR 660	The vent does not originate from a distillation operation
	NSPS Subpart RRR	Does not apply	40 CFR 700	The equipment does not have any gaseous vent streams
FUG012	NSPS Subpart VV	Does not apply	40 CFR 60.480	No modification after January 5, 1981
	LAC 33:III.2121	Does not apply	LAC 33:III.2121	Subject to LAC 33:III.2122
FUG013, FUG014	LAC 33:III.2121	Does not apply	LAC 33:III.2121	Subject to LAC 33:III.2122
	LAC 33:III.2122	Does not apply	LAC 33:III.2122.A.6	Subject to 40 CFR 60 Subpart VV
The above table provides explanation for both the exemption status or non-applicability of a source cited by 2 or 3 in the matrix presented in Section X of the permit				

VII. STREAMLINED REQUIREMENTS

The Permit does not include any streamlined requirements.

VIII. GLOSSARY

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of

production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

CAM - Compliance Assurance Monitoring rule – A federal air regulation under 40 CFR Part 64

Carbon Black - A black colloidal substance consisting wholly or principally of amorphous carbon and used to make pigments and ink.

Carbon Monoxide (CO) – (Carbon monoxide) a colorless, odorless gas produced by incomplete combustion of any carbonaceous (gasoline, natural gas, coal, oil, etc.) material.

Cooling Tower – A cooling system used in industry to cool hot water (by partial evaporation) before reusing it as a coolant.

Continuous Emission Monitoring System (CEMS) – The total combined equipment and systems required to continuously determine air contaminants and diluent gas concentrations and/or mass emission rate of a source effluent.

Cyclone – A control device that uses centrifugal force to separate particulate matter from the carrier gas stream.

Duct Burner – A device that combusts fuel and that is placed in the exhaust duct from another source (such as a stationary gas turbine, internal combustion engine, kiln, etc.) to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a steam generating unit.

Federally Enforceable Specific Condition - A federally enforceable specific condition written to limit the potential to Emit (PTE) of a source that is permanent, quantifiable, and practically enforceable. In order to meet these requirements, the draft permit containing the federally enforceable specific condition must be placed on public notice and include the following conditions:

- A clear statement of the operational limitation or condition which limits the source's potential to emit;
- Recordkeeping requirements related to the operational limitation or condition;
- A requirement that these records be made available for inspection by LDEQ personnel;
- A requirement to report for the previous calendar year.

Grandfathered Status- Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Heat Recovery Steam Generator (HRSG) – A steam generator that recovers exhaust heat from a gas turbine, and provides economizing and steam generation surfaces.

Hydrogen Sulfide (H_2S) - A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the action of acids on metallic sulfides, and is an important chemical reagent.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

NESHAP - National Emission Standards for Hazardous Air Pollutants –Air emission standards for specific types of facilities, as outlined in 40 CFR Parts 61 through 63

Nitrogen Oxides (NO_x) - Compounds whose molecules consists of nitrogen and oxygen.

Nonattainment New Source Review (NNSR) - A New Source Review permitting program for major sources in geographic areas that do not meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. Nonattainment NSR is designed to ensure that emissions associated with new or modified sources will be regulated with the goal of improving ambient air quality.

NSPS - New Source Performance Standards – Air emission standards for specific types of facilities, as outlined in 40 CFR Part 60

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit- Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$10 tons per year of any toxic air pollutant; $\geq$25 tons of total toxic air pollutants; and $\geq$100 tons per year of regulated pollutants

(unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10}- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.